Salmon Program

State Recovery Projects
Application Project Summary

TITLE: Seabeck Creek Culvert Engineering & Design - 142

NUMBER: 09-1619P (Planning/Acquisition)
STATUS: Preapplication

APPLICANT: Hood Canal SEG

CONTACT:

COSTS:

RCO	$86,000	81 %
Local	$20,770	19 %
Total	$106,770	100 %

SPONSOR MATCH:

Grant - Private	$20,770

DESCRIPTION:

The project consists of prioritizing the replacment of a series of eight fish blockage culverts located along Seabeck Creek, Kitsap County, WA. Seabeck Creek is an Intensively Monitored Watershed (IMW), managed by the State Departments of Fish and Wildlife and Ecology to evaluate efforts to maintain enhance and restore the creek's habitat value for fish and wildlife. The creek contains a high level of natural ecological function and structure, but lacks large woody material and associated pools. The shortage of pools is significant because of the extremely low flows that occur during summer that limit the availability of rearing habitat for juvenile salmon. The watershed and the stream bed are gravelly, rainfall is about 52 inches per year, and the 100 year peak flow is on the order of 424 cfs. A major storm during December 2007 flowed at about 800 cfs, transported a tremendous load of stream gravel into the lower portions of the stream channel, and damaged and overtopped several of the existing culverts. The 5 square mile watershed is mostly forested, but also contains pockets of rural and suburban development served by a network of roadways that cross the creek at about 30 locations. Eight of these creek crossings have been identified by WDFW as needing replacement to restore fish passage. Engineering design is required to establish site geometry necessary to restore fish passage and stream functioning, and to select the replacement culverts and/or bridges. Temporary detour roadsare required during construction,

LOCATION INFORMATION:

LEAD ENTITY ORG: Hood Canal Coor Council LE

COUNTY:

SALMON INFORMATION: (* indicates primary)

Species Targeted

Chum*
Coho
Searun Cutthroat
Steelhead

Habitat Factors Addressed

Channel Conditions
Loss of Access to Spawning and Rearing Habitat*
Streambed Sediment Conditions
Water Quality

LAST UPDATED: June 21, 2009 **DATE PRINTED:** June 25, 2009

Planning Cost Estimate Summary

Hood Canal SEG **09-1619 P**

Seabeck Creek Culvert Engineering & Design - 142 **Salmon State Projects**

Element/Item	Unit	Quantity	Unit Cost	Total Cost	Description Needed	Description
Worksite #1, 8 Existing Seabeck Culverts						
Professional Services						
Professional services - other	Lump sum	1.00	$106,770.00	$106,770.00	Optional	Surveying, Base Mapping and Geotechnical service consisting
Project Tax Amount				$0.00		
Project A&E Amount				$0.00		
Project Total Costs				**$106,770.00**		

Seabeck Creek Culvert Assessment& Design # 142

PROJECT PROPOSAL – NON-CAPITAL PROJECTS AND COMBINATION PLANNING/ACQUISITION PROJECTS (EXCLUDING BARRIER INVENTORIES)

INSTRUCTIONS: Salmon Recovery Funding Board applicants must respond to the following items. Please respond to each question individually -- do not summarize your answers collectively in essay format. Local citizen and technical advisory groups will use this information to evaluate your project. Contact your lead entity for additional information that may be required. Limit your response to eight pages.

Submit information via PRISM attachment process. Application checklists and attachment forms may be downloaded off the SRFB Web site at http://www.rco.wa.gov/srfb/docs.htm.

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1) PROJECT OVERVIEW

Explain your project overall and include the following elements:

a) *List your primary project objectives, such as how this project will contribute to understanding or restoring salmonids within the ecosystem. For example, the objectives might be to characterize the extent and nature of a certain factor limiting salmonid productivity, identify sources that contribute to the problem and prioritize restoration and management activities to address the problem; to assess landowner willingness to participate in a future land acquisition or restoration project; or to determine project location, feasibility, and design.*

The project consists of prioritizing and replacing a series of eight fish blockage culverts located along Seabeck Creek, Kitsap County, WA. Seabeck Creek is an Intensively Monitored Watershed, managed by the State Departments of Fish and Wildlife and Ecology to evaluate efforts to maintain, enhance and restore the creek's habitat value for fish and wildlife. The creek contains a high level of natural ecological function and structure, but lacks large woody material and associated pools. The shortage of pools is significant because of the extremely low flows that occur during summer that limit the availability of rearing habitat for juvenile salmon. The watershed and the stream bed are gravelly, rainfall is about 52 inches per year, and the 100 year peak flow is on the order of 424 cfs. A major storm during December 2007 flowed at about 800 cfs, transported a tremendous load of stream gravel into the lower portions of the stream channel, and damaged and overtopped several of the existing culverts.

b) *State the nature, source, and extent of the problem or gap in knowledge that the project will address, including the primary causes of the problem, not just the symptoms. Explain how achieving the project objectives will help solve the problem. For fish passage design/feasibility studies, concisely describe the passage problem (outfall, velocity, slope, etc); the current barrier (age, material, shape, and condition); whether it is a complete or partial barrier; and the amount and quality of habitat to be opened if the barrier is corrected.*

A major storm during December 2007 flowed at about 800 cfs, transported a tremendous load of stream gravel into the lower portions of the stream channel, damaging and overtopped several of the existing culverts. This project assesses the damage, designs and prioritizes the eight (8) replacement culverts that act as partial to full fish passage barriers thus reopening approximately six (6) square miles of fish spawning and rearing habitat.

c) *Describe the fish resources (species and life history stages present, unique populations), the habitat conditions, limiting factors, and historic factors important to understanding this project. Be specific-- avoid general statements. Which salmonid species and life cycle stage(s) are targeted to benefit by this project?*

The main stem of Seabeck Creek is five (5) miles long with sixteen (16) miles of tributaries. Chum, Coho and Steelhead are all present in the watershed which supports excellent spawning and rearing habitat.

Land use in the Seabeck Creek Watershed is a mix of rural residences, forestlands, small hobby farms, limited aquaculture, the town of Seabeck and a marina.

d) *Describe how this project fits within your regional recovery plan or local lead entity strategy (i.e., Does the assessment fill a data gap identified as a priority in the lead entity's strategy or regional recovery plan? Does the project address a priority action, occur in a priority area, or target priority fish species?).*

This project is not specifically listed in the lead entity three year ESA plan due to the recent nature of the high water events that caused the fish passage blockages. However Seabeck Creek is one of four (4) Intensively Monitored Watersheds on the Hood Canal and therefore a priority 1 habitat.

e) *Has any part of this project been previously reviewed and/or funded by the Salmon Recovery Funding Board? If yes, please provide the project name and SRFB project number (or year of application if a project number is not available). If the project was later withdrawn for funding consideration or was not awarded SRFB funding, please describe how the current proposal differs from the original.*

No.

When possible, list your sources of information by citing specific studies, reports, and other documents.

- "Seabeck Creek Channel and Sediment Assessment", Technical Memorandum prepared for the Intensively Monitored Watershed Project, Department of Ecology, March 25, 2008
- "Salmonid Habitat Limiting Factors", WRIA 15 N & 14W, Washington State Conservation Commission, June 2003

2) PROJECT DESIGN

a) *Describe the location of the project in the watershed, including the name of the water body(ies), upper and lower extent of the project (if only a portion of the watershed is targeted), and whether the project occurs in the nearshore, estuary, main stem, tributary, off channel, or other location.*

The project area is located on the main stem of Seabeck Creek from RM 4 to the estuary and up tributary 5 for approximately one mile.

b) *If the project will occur in phases, explain individual sequencing steps and which steps are included in this application.*

The project does not occur in phases.

c) *Describe what products will be produced (i.e., project deliverables). If a project design will be produced, what stage of project development is proposed (conceptual, preliminary, or final-- refer to Appendix D – Project Development Phases Defined)?*

The final design process addresses and resolves all substantial issues that have been raised in the permitting and stakeholder review process, so that all stakeholders agree on

the final plans. As with the preliminary design work, preparation of the final design will be done under the supervision of a licensed Professional Engineer.

Final Design tasks include:

(1) Revision of preliminary design drawings

(2) Preparation of additional detailed drawings as needed to clarify the design of specific work items

(3) Preparation of technical specifications to fully describe each part of the work.

(4) Preparation of a final construction cost estimate

(5) Preparation of contract bidding documents and general contract conditions.

Final Project Design concludes with a comprehensive and detailed set of project drawings, technical specifications, and contract documents. An "Engineer's Estimate" of construction cost will also be prepared by the designer, for comparison with estimates provided by general contractors (bids).

d) Explain how the results of the project will lead directly to habitat restoration projects that benefit salmonids.

Restoring culverts designed appropriately will ensure blockage free passage for salmonids during both the spawning and rearing portion of their lifecycle.

e) If your proposal includes a Fish Passage or Screening Design/Feasibility Study :

To be determined by the assessment & design.

f) If your proposal includes an Assessment or Inventory (NOTE: project may extend across a wide area and cover multiple properties):

Not applicable

3) PROJECT DEVELOPMENT

a) List the individuals and methods used to identify the project and its location.

- Hood Canal Salmon Enhancement Group, Neil Werner, Project Sponsor
- Kitsap County Public Works, John Brand, Roadway Owner
- WDFW, Ryan Nauer and Gina Piazza, Area Biologists
- Washington Department of Ecology, and
- Hood Canal Coordinating Council, Richard Brocksmith, Project Manager.

b) Explain how the project's cost estimates were determined.

With numerous similar environmental projects completed in the Hood Canal Watershed, Smayda Environmental Associates, Inc. developed the budget based on their knowledge of the specific IMW area.. Cost estimates were spot checked with local construction subcontractors for reasonableness.

c) Describe other approaches and design alternatives that were considered to achieve the project's objectives.

Not applicable

d) Describe the consequences of not conducting this project at this time. Consider the current level and imminence of risk to habitat in your discussion.

Not prioritizing the design and replacement of the eight (8) culverts in question will block up to six square miles of habitat located in an Intensively Monitored Watershed (IMW).

e) Include a Partner Contribution Form, when required, from each partner outlining its role and contribution to the project. This form may be downloaded off the SRFB Web site. State agencies are required to have a local partner that is independently eligible to be a project sponsor. A Partner Contribution Form is also required from partners providing third-party match.

Available in PRISM

f) List all landowner names. Include a signed Landowner Acknowledgement Form (download off the SRFB Web site) from each landowner acknowledging their property is proposed for SRFB funding consideration. If an assessment covers a large area and encompasses numerous properties, Landowner Acknowledgement Forms are not required. For sponsors proposing feasibility/assessment work on their own property this form is not required. For multi-site acquisition projects involving a relatively large group of landowners, include, at a minimum, signed Landowner Acknowledgement Forms for all known priority parcels.

Landowners will be determined before design work begins.

g) Describe your experience managing this type of project. List the names, qualifications, roles and responsibilities for all known staff, consultants, and subcontractors who will be designing and implementing the project. If unknown, describe the selection process.

The HCSEG was founded in 1990. During the subsequent nineteen (19) years the HCSEG has completed 121 separate ecosystem preservation, acquisition, and remediation projects at a total cost of approximately $18,500,000.00. All projects have been completed in accordance with design criteria and the overarching project plan(s). This record of achievement and success indicates a near perfect probability of success on this project as well. Specific examples of our work can be accessed on our web site: www.hcseg.org.
Key project supporters include:

1) **Neil W. Werner** – **Project Manager**; Executive Director Hood Canal Salmon Enhancement Group.
2) **Kim Gower - Office Manager** responsible for general administrative business operations.
3) **Mona Pillers – Office Accountant** and Administrative Assistant responsible for the day to day functions of financial accounting; researches information for projects, grants and legislative policies.
4) **Bruce Dees & Associates** Landscape Architecture – Site Planning – Recreation Facilities Design. http://www.bdassociates.com/
5) **Construction Contractor(s)** – The contractor will be selected following the best and final proposal submitted from a list of qualified (responsive & responsible) contractors maintained and updated annually by the HCSEG in accordance with standard policy and procedures.

Others may be selected with experience in near shore and estuary issues and familiar with Hood Canal Watershed prior to contract award(s). No additional expertise is anticipated for this proposed project.

4) TASKS AND SCHEDULE

Task 1. Field Survey and Base Map Preparation

Given the topography, significant trees, and potential requirements for detours and easements, professional survey services are necessary to provide the following survey:

(1) The sizes of the seven survey areas are estimated to be 1.5 acres each and to be cross-shaped. The survey will include 500 feet of road and 500 feet of creek.

(2) Locate culverts, channels, ditches, roads, shoulders, fencing, utilities, trees greater than 10” DBH and establish culvert types, diameters, and invert elevations.

(3) Develop Centerline Control, six Cross Sections across the creek, Profiles for the road and for the creek, and Topographic Data to show contours at 1-foot intervals on each side of existing road centerline and creek channel.

(4) Establish horizontal and vertical location of road, ROW and channel centerlines and edges.

(5) Set two Bench Marks at each of the eight sites in convenient, clearly marked locations, referenced to road centerline and an appropriate datum.

(6) A base map, profiles and cross sections of the project area shall be prepared for 11x17 inch paper at a scale of 1 inch = 20 feet, or other, as suitable. An electronic AutoCAD file of the map shall be provided to THE PROJECT MANAGER.

Task 2. Site Inspections and Meetings

The contractor shall:

(1) Inspect the sites on three occasions to develop and refine the design. During the inspections, the project manager will measure channel and road characteristics, evaluate upstream and downstream conditions, and photograph the site. Additional portions of the stream channels will be walked to look for "reference reaches" that may serve as prototypes for the restoration design. One goal is to determine stream characteristics such as OHW width, bank shapes, gravel size, erosion and deposition, sinuosity, and other factors so that suitable reaches can be constructed within the project areas.

(2) Attend three meetings at Kitsap County Public Works in Silverdale, HCSEG office in Belfair and/or at other Kitsap County locations. THE PROJECT MANAGER assumes that HCSEG will coordinate site access with the landowners.

Task 3. Geotechnical Investigation

The Contractor will perform the following geotechnical engineering services:

(1) Perform a site visit to locate and mark exploration locations in the field and to recon the general area of the site. The contractor will contact the One-Call utility locate service to provide utility clearances before the exploration effort.

(2) Drill one or two test borings up to 20-feet deep on the side(s) of the culvert replacement locations. Truck or trailer mounted drilling equipment will be used. We will not drill deeper than the aforementioned depth without prior authorization. The borings will be monitored and logged under the full-time observation of a PanGEO geotechnical engineer or engineering geologist. Standard Penetration Test (SPT) samples will be obtained at approximately 5-foot intervals with the exception of the upper 10 feet of the borings which will have SPT samples on 2½-foot intervals. The site soils are assumed to be "clean" (i.e., no hazardous materials or contamination), therefore drill cuttings will be disposed of on site. Conduct laboratory testing to determine certain index properties of the on-site soils, including moisture content, grain size analysis, and Atterberg Limits.

(3) Perform engineering analysis and evaluate data derived from items 1 and 2 above, with respect to the items listed under item 4, below.

(4) Prepare a Geotechnical Report containing the results of our geotechnical study to support preparation of the PS&E, including descriptions of surface and subsurface conditions, and a site plan showing exploration locations and other pertinent features. Summary exploration logs, charts and graphs indicating laboratory test results will also be included. The results of the engineering evaluations and preliminary geotechnical engineering recommendations pertaining to the following items will be presented:

a) Type, depth, allowable and ultimate bearing resistances, bearing elevations at each abutment, and anticipated settlements of foundation elements for the new structure;

b) Geotechnical design criteria for the replacement structure, including seismic design requirements and liquefaction hazard analysis (if applicable);

c) Constructability issues and concerns.

Note that the scope of work does not include evaluation of chemical or hazardous material properties of soil and groundwater, special handling or disposal, or the potential presence of wetlands on the site.

Task 4. Alternatives Analysis, Design Criteria and Prioritization Schedule

A memo will be prepared to summarize results of the survey, geotechnical work and other site conditions to propose a design approach and sequence. The report is intended to establish consensus about the design approach, the types of structures to be installed, and about the proposed sequence of construction.

(1) A design memo shall be prepared to describe the results of the survey and test pits, and to summarize other data, such as creek flow rates and slopes, vegetation patterns, storm water flows, site grading, soil haul, and other factors. Reference areas will be described so that natural shapes, slopes, elevations and stream bed conditions can be re-created. Design and equipment access recommendations will be provided, and design criteria will be suggested.

(2) Crossing alternatives, such as bridges versus culverts and pile foundations versus spread footings, will be presented.

(3) Preliminary construction cost estimates will be prepared.

(4) The work products are three copies of the Draft and five copies of the Final Design Memorandum. I assume that HCSEG will share these and will solicit comments from Kitsap County, HCCC, WDFW and/or other interested parties, and will provided comments to THE PROJECT MANAGER.

Task 5. Preparation of Plans, Specifications and Cost Estimates

For the purposes of this Scope of Work, THE PROJECT MANAGER assumes:

- The roadways will be restored to pre-construction conditions,
- The creeks shall be restored to “reference reach” conditions,
- Crossing shall comply with WDFW and WSDOT criteria,
- All culverts, rubble, pilings and surplus soils will be hauled offsite.

- Planting will occur on all exposed soils.
- The plans will be prepared using English units rather than metric.
- Traffic Control Plans are necessary and the roads may be required to remain open to travel as determined by Kitsap County during the conceptual design process.
- Design sheets will be on 11" x 17".

The following work elements are recommended:

(5) THE PROJECT MANAGER shall develop 30%, 90% and Final Design Plans. The plans will show the road, creek and enough of the surrounding landscape to establish site features. Sheets will include (1) a cover sheet with location map, (2) a plan view with grading plan, (3 and 4) road and creek cross sections and profiles, (5 and 6) proposed culvert profile and section, (7 and 8) details, (9) summary of quantities, structure notes, and other necessary tabulations, (10) detour and traffic control plan, and (11)erosion control plan. Staging areas and construction entrances shall be shown.

(6) THE PROJECT MANAGER shall develop 90% and Final Construction Cost Estimates and Construction Schedules. The cost estimate shall list bid items showing quantity, unit of measure, unit cost, and total cost for each. The construction schedule shall include notes about limitations to schedule such as "fish windows", traffic flow, and wet-season erosion control issues.

(7) Construction Specifications shall be provided on the design drawings rather than as a separate document.

(8) The 30%, 90% and Final work products shall be provided to the project team electronically plus, to HCSEG, 4 paper copies of the 30% and 90%, and 10 paper copies of the Final plans.

(9) The plans will be prepared with adequate precision and detail to permit the convenient layout in the field for construction. Plans shall be in such detail as to permit the development of an accurate estimate of quantities for the items of work to be performed. Data in plans shall show creek centerlines, culverts, profiles, vegetation, fences, gates, upstream/downstream controls and related matters such as quantities, special designs, benchmarks, creek alignment, construction approaches, detours, utilities, and other details pertaining to construction.

(10) All materials and installation procedures shall be in conformance with WDFW and Kitsap County standards except as modified by HCSEG or THE PROJECT MANAGER to address specific project needs.

Task 6. Permitting Assistance

Hydraulic Project Approval (an HPA) from WDFW is necessary. A temporary easement from the Hoh River trust may be needed for the temporary detour road across their property. A Right-of-Way permit is needed from Jefferson County. Because this is a road maintenance project, other permits are assumed to be unnecessary.

(1) THE PROJECT MANAGER shall prepare the JARPA, the expedited permit form (if applicable), and necessary attachments. The JARPA will be provided to HCSEG

electronically for HCSEG to print, sign and obtain landowner signatures. HCSEG will then submit to WDFW and Kitsap County.

(2) THE PROJECT MANAGER will prepare the Right-of-Way permit for Kitsap County.

(3) THE PROJECT MANAGER will maintain telephone contact with the WDFW Area Habitat Biologist and Kitsap County Public Works to help streamline the permitting process.

Task 7. Services during Construction

THE PROJECT MANAGER will be available to be onsite during some of the construction to help manage the field effort. Construction related tasks include such things as pre-construction meeting, and directing some aspects of the construction, especially instream work, elevations and alignment.

Project Schedule	
June 2009	Topographic Survey, Site Inspection, Kitsap County Meeting
July 2009	Geotechnical investigation
September 27, 2009	Submit Alternatives Analysis Memo
October 15, 2009	30% Design to Project Team for their review
November 15, 2009	Review Comments received by THE PROJECT MANAGER from Project Team
December 15, 2009	90% Design Plans & Cost Estimate submitted to Project Team
February 1, 2010	Final Design Plans, JARPA and cost estimate submitted to Project Team
August 2010	Construction starts

2) CONSTRAINTS AND UNCERTAINTIES

Each project should include an adaptive management approach that provides for contingency planning. State any constraints, uncertainties, possible problems, delays, or unanticipated expenses that may hinder completion of the project. Explain how you will address these issues as they arise and their likely impact on the project.

No major constraints, uncertainties or delays are anticipated. Of course other issues may arise that, if left unmanaged, may hinder or delay the completion of the project on time, budget or meeting quality norms. The only sensible strategy is to closely manage the project and deal with or escalate problems or delays as they arise and before they have a chance to spiral out of control. Our team's ability to adaptively manage contingencies is proven and governed by our "readiness strategy".

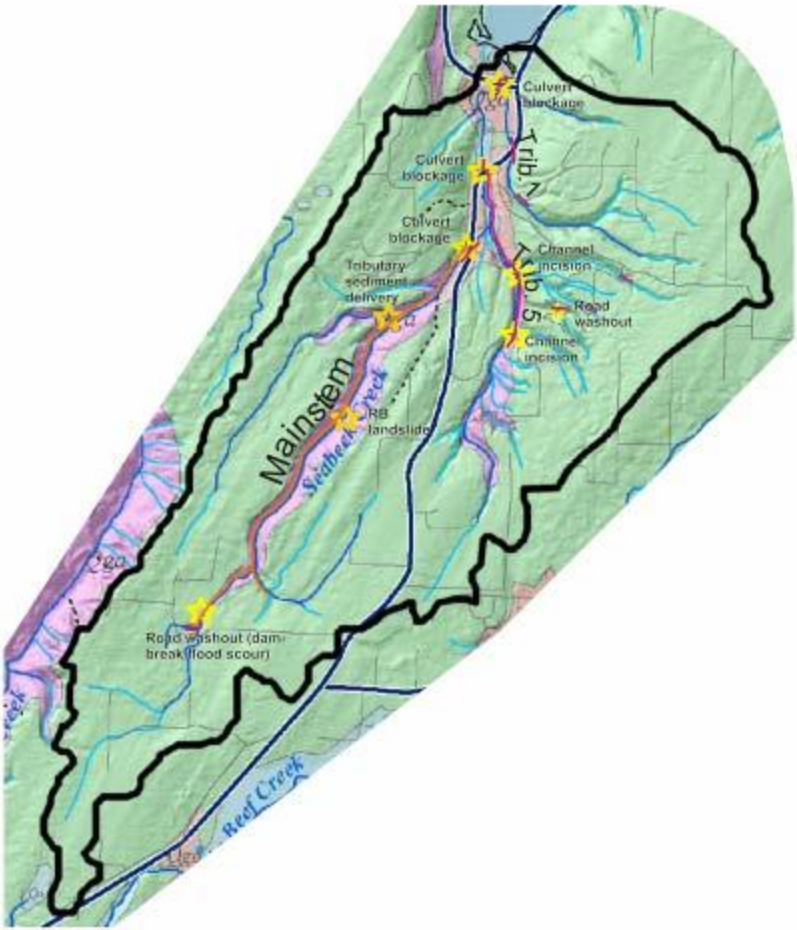
Readiness-Building Strategy - Readiness for ecosystems restoration begins with the creation of a team dedicated to developing a coherent vision of a successful initiative. Our team is a cross-functional team, made up of scientific, technical, administrative, program / project management, education, and information systems personnel. Their mission is to develop a focused, aligned vision of how ecosystem restoration will meet specific needs articulated in the Governor's Puget Sound Partnership and the HCCC Recovery Strategy. Moreover the

strategy is tailored to fit into the unique Hood Canal / Quilcene Bay environment. This team, along with the Lead Entity helps ensure buy-in and commitment from multiple stakeholder groups as buy-in is considered vital to a successful restoration project.

Our team is formed. We have completed the project assessment and prioritization (initiation) phase, and the planning phase. We have worked together over the years and we are ready to quickly and effectively complete the execution / control and close-out phases of this project.

Supplemental Questions

3) PROJECTS INVOLVING ACQUISITIONS (Applies to Combination Projects)– N/A



Hood Canal SEG; Seabeck Creek Culvert Engineering & Design - 142 (#09-1619)

Images

Figure 1Example of a large log impounding a relatively stable wedge of sediment upstream. Rare in the current configuration of Seabeck Creek, these features would have been much more common in pre-industrial time and imposed a dominant control on channel form and process.

Figure 2 Channel entrenchment. Note the root in the middle of the picture indicating recent severe erosion, now suspended more than a meter above the bed of the channel but presumably once growing underground

Figure 3 Trapping and storage of bed sediment behind logs and other woody debris in the main stem of Seabeck Creek, about 3 km downstream of the Hite Center Road crossing.

Figure 4 Seabeck Creek approaching the NW Seabeck–Holly Road crossing (road visible in far distance). In contrast to previous views of the channel, this clearly shows the effects of a large sediment load that is being transported into the reach much more rapidly than it can be transported out. The obvious reason for this imbalance is the limited hydraulic capacity of the downstream culvert.

Figure 5 Note the last remnants of the gravel bedload sediment perched on the now-abandoned bed of the pre-incised channel in the left foreground. The origin of the culvert seen in the photograph was not determined.

Figure 6 Sand deposited during the storm flows of December 2007, on the upstream side of NW Seabeck–Holly Road; a consequence of the inadequate culvert capacity that impounded floodwaters onto surrounding property.